

May 15, 2001

Subject: Request for Proposal (RFP) No. JPL-MAV-2001, Mars Ascent Vehicle
Concept Study, Addendum 4

Based upon a continued review of the subject RFP, additional questions and requests for clarification have been received at JPL. The following includes a revision to the RFP, a revision to the Specimen Contract and a list of questions received and the JPL responses:

1. The RFP General Instructions are revised as follows:
 - 1.1 Under paragraph 4.1.1, delete the recommended page limit of "40 pages" and substitute the new recommended page limit of "50 pages."
 - 1.2 Under paragraph 5.4, delete the reference to the RFP website of "(http://acquisition.jpl.nasa.gov/rfp/MAV_01)" and substitute the corrected website of "(<http://acquisition.jpl.nasa.gov/rfp/mav>)."
2. The Specimen Contract, dated 5/8/01 issued as a part of Addendum 3 on May 5, 2001, is revised to include Article 4 as follows:

ARTICLE 4. LIMITATION OF JPL'S OBLIGATION

- 1.0 The Firm Fixed Price of this Contract is the amount set forth in paragraph 1.0 of ARTICLE 2, PRICE AND PAYMENT, subject to the limitations set forth in this Article.
- 2.0 Subject to paragraph 6.0 below, the amount set forth in Period No. 1 of the following Incremental Liability Schedule reflects the maximum limitation of the Institute's liability for all purposes, including incurred costs, termination costs (including amounts payable with respect to subcontracts and settlement costs) and allowance for profit or fee:

INCREMENTAL LIABILITY SCHEDULE

Period No.	Cumulative Maximum Liability	Terminal Date
1	\$200,000.00	11/1/01.
2	Balance	N/A

- 3.0 It is anticipated that JPL shall, prior to the terminal date, if any, of the Period specified in the first line of paragraph 2.0 above, issue a Unilateral Modification to revise the maximum limitation to the amount set forth in the next successive period. The determination as to whether to issue such a modification shall be at JPL's sole discretion. In the event that JPL does not issue such a modification prior to the terminal date, this Contract shall, unless the Contractor requests a terminal date extension in writing prior to the terminal date, be deemed terminated for convenience and the Contractor shall proceed as if the Contractor has received a Notice of

Termination pursuant to the GP Article entitled "Termination for Convenience." JPL shall, upon receipt of a written request from the Contractor for Terminal Date extension, immediately issue a unilateral modification extending the Terminal Date in accordance with Contractor's request. If the Contractor or JPL have reason to believe that any other change in the Incremental Liability Schedule would be in the best interest of the contract effort, the Contractor or JPL may notify the other party in writing to that effect, together with the requested change. If the Contractor and JPL agree with the requested change, the Incremental Liability Schedule will be revised by Supplemental Agreement to the Contract.

- 4.0 In the event that JPL issues such a UM to increase the liability after the terminal date, the Contract shall no longer be deemed terminated, and such UM shall have the same effect as if it had been issued prior to the terminal date; provided however, that if JPL's failure to issue the UM by the terminal date caused an increase of the cost of, or the time required for, performing this Contract, because the Contractor proceeded as if a Notice of Termination had been issued, an equitable adjustment shall be made in (i) the Contract Price, the time of performance, or both; and (ii) other affected terms of the Contract. The Contractor must assert its right to such equitable adjustment within 30 days of receipt of the UM. However, if JPL decides that the facts justify it, JPL may receive and act upon a proposal submitted before final payment of the Contract. Subject to paragraph 6.0 below, in the event that this Contract is terminated pursuant to this Article, or otherwise terminated by JPL pursuant to the GP Article entitled "Termination for Convenience," the cumulative liability amount set forth in the Incremental Liability Schedule for the Period referenced in the first sentence of paragraph 2.0 of this Article, reflects JPL's maximum liability notwithstanding anything to the contrary in the GP Article entitled "Termination for Convenience," or the value of supplies and services delivered to and retained by JPL.

- 5.0 The Contractor has used the Incremental Liability Schedule to plan its progress payments, partial payments, obligations and termination liability. It is a management prerogative of the Contractor to determine if any part of these elements are to be under funded or at risk (relative to the Incremental Liability Schedule) for any period of time. This is a firm fixed price type Contract. The Contractor assumes all risk for any variance between planned and actual costs, including planned and actual termination liability. The Contractor is strictly liable for all cost variances, including cost variances attributable to indirect rate changes and shall in no event be excused from the obligation to complete performance in accordance with the price, delivery schedule, and technical requirements of this Contract.

- 6.0 If the Contract is modified, the provisions of this Article shall not limit the Contractor's obligation pursuant to GP Article entitled "Changes," to diligently pursue the performance of the Contract as modified. In the event that a unilateral modification contains a liability limit for work performed under such modification, the Contractor's obligation to pursue performance of such modification and the Institute's liability for such modification, shall, until the UM(s) is bilaterally settled, be limited by the

amount of the liability limit included in the UM. Until such a UM is settled, the liability limit on the UM does not increase the baseline liability in paragraph 2.0. In the event that this Contract is deemed terminated pursuant to paragraph 3.0 of this Article or the GP Article entitled "Termination for Convenience," prior to the settlement of an outstanding UM(s), the Institute's maximum liability for all purposes, including incurred costs, termination costs (including amounts payable with respect to subcontracts and settlement costs and consideration for delivered supplies and services) and allowance for profit or fee, shall be no more than the sum of the cumulative liability amount set forth in the Incremental Liability Schedule for the Period referenced in the first sentence of paragraph 2.0 of this Article, plus the liability limit(s) set forth in the UM(s).

7.0 In the event that this Contract contains a provision providing for progress payments, such provision shall be subject to the limitations set forth in this Article and the "contract amount" referred to in any such provision for progress payments is the Firm Fixed Price of this Contract set forth in paragraph 1.0 of ARTICLE 2, PRICE AND PAYMENT.

8.0 The provisions of the Article shall in no way limit the Institute's rights under the GP Article entitled Default.

3. Questions and Answers

Question 1

The Specimen Contract provided with the RFP (dated 04/05/01) includes Article 1, Statement of Work and Delivery Instructions. Also included with the RFP is Exhibit I (dated 03/15/01), titled "Mars Ascent Vehicle (MAV) Trade Study- Contract Support:Statement of Work". These two documents appear to conflict. Please clarify which is intended to be the statement of work against which contractors are to propose.

Answer 1

Addendum 3, issued on May 10, 2001, contains a revised Specimen Contract, including a revised Exhibit 1, which should resolve any conflict.

Question 2

Exhibit I Figure 1 appears to have incorrect dates for the MSR TA Study milestones.

Answer 2

In the revised Exhibit 1 issued as a part of Addendum 3 on May 10, 2001, these dates have been eliminated. For the latest schedule of relevant dates, see the revised Specimen Contract, issued on May 10, 2001.

Question 3

Exhibit I Paragraph IV, CONTRACTOR SUPPORT GUIDELINES is unclear. In particular, the following sentence appears to have missing words: "Team proposals for

fully integrated MAV concepts are any approved proposals will be funded from about June 18, 2001." Please clarify.

Answer 3

In the revised Exhibit 1 issued as a part of Addendum 3 on May 10, 2001, this sentence has been eliminated.

Question 4

Specimen Contract Article I, Paragraph 1.3 states "Mars Ascent is defined as beginning at the Mars surface for launch and ending at Mars Orbit Rendezvous (MOR), or Deep Space Rendezvous (DSR), or Direct Return to Earth/Entry (DEE)..." Is it intended that the contractor evaluate the spacecraft necessary to perform these missions as a part of the MAV, or are the SEP stage and entry vehicle (if required) simply intended to be defined by the mass and volumes provided in the assumptions? For a DEE mission (for example), is the MAV mission defined to include the function of the SEP stage and entry vehicle necessary for the return to Earth, or is the MAV mission defined to end with the separation of these elements from the MAV?

Answer 4

Please see the revised Exhibit 1 issued as a part of Addendum 3 on May 10, 2001. Effective payload masses, the masses to be lifted from the Mars surface, for various sample return approaches have been delineated in Table 1 of the revised Exhibit 1. For the DEE mission, the SEP stage is considered as a payload for the MAV, and the MAV function ends with the separation of SEP from MAV.

Question 5

Am I reading the solicitation correctly if I understand that the MSR Technical Approach Study has already begun (i.e., the contractors have been selected and have started working)? And assuming this work has begun, is the intent to use the MSR study to clearly define (or constrain) the trade space for the MAV trade study?

Answer 5

Yes, the MSR Technical Approach Study has already begun. The MAV Concept Study:

- is separate and distinct from the MSR Technical Approach Study.
- has Ground Rules and Requirements as specified in Table 1 of the revised Exhibit 1, issued as a part of Addendum 3 on May10, 2001.
- will incorporate results from the MSR Phase 1 Study, as specified in the revised Specimen Contract.
- will be more in-depth than the MSR Technical Approach Study.
- will include baseline and enhanced design concepts

Question 6

In addition, are there is specific requirements concerning teaming on this study? If teaming is being considered, does this need to be described in the letter of intent on May 1st?

Answer 6

There is no requirement for teaming. If teaming is considered it does not need to be identified in advance of the proposal due date.

Question 7

The statement of work in the MAV Trade Study RFP is significantly similar to the MAV portion of the SOW for the Mars Sample Return Trade Study. Many of the potential bidders on the MAV Trade Study RFP are either prime contractors or subcontractors on the MSR Trade Study. Please clarify how the MAV SOW is different from that of the MAV portion of the MSR Trade Study.

Answer 7

The MAV Concept Study is different and distinct from the MSR Technical Approach Study in the following ways:

- It provides much more detailed concepts and assessment of technology, performance, risk, and economics for liquid, solid, hybrid, or gel propulsion ascent vehicles.
- It defines a detailed Baseline design.
- It utilizes State of the Art (SOA) technologies which require some development.
- It defines the testing, demonstrations, and/or analyses required for Enhanced Design.
- It incorporates advanced propulsion technology.
- It identifies and explores realizable improvement areas.
- It delineates the technology programs required to realize specific improvements.
- It defines the testing, demonstrations, and/or analyses required to bring the technologies to a NASA TRL 7 to support the MSR missions.

Question 8

In Volume II - Cost Instructions, the RFP directs us to "Provide a total price for each item listed in Article 1 ...". Is a single total price for all items in Article 1 acceptable and if not, what level of subparagraph in Article 1 constitutes an item?

Answer 8

The revised Volume II - Cost Instructions issued as a part of Addendum 3 on May 10, 2001, requires that a total price be provided for each of the two deliverables specified in the revised Article 2. Supporting cost data must be provided on Attachment A-19, or alternate computer generated form, for each deliverable. In addition, WBS level 2 study hours are now required for each item per the revised cost instructions.

Question 9

Do you have an estimate of the release date of an addendum to the MAV

Trade Study RFP? Given the conflicts in the SOW, it is difficult to properly prepare a proposal without that information. Will the May 16 due date remain, or will it be moved?

Answer 9

Yes, the revised RFP and associated documents were posted on the Web on 05/10/01. The date for proposal submission has been extended to no later than 3:00 p.m., local time on June 6, 2001.

Question 10

The Exhibits of the Specimen Contract (specifically Exhibit I, SOW, and Exhibit IV, Technical Approach Study Products List) are somewhat contradictory. We believe the work related to the RFP is for the entire MAV architecture yet Exhibit I (SOW) focuses the effort on the propulsion aspects of the study. Is the intent of the study to focus on the propulsion requirements using the rest of the architecture to support it, or is it on the entire MAV implementation with the propulsion simply an element of it?

Answer 10

See Answer 5.

Question 11

Are the dates incorrect in Figure 1, Exhibit I? (Specifically those relating to the MSR TA Study). If they are, what are the correct dates?

Answer 11

See Answer 2.

Question 12

What is the basis for the Solar Electric Propulsion Stages called out in Table 1 of Exhibit I? We assume that this means that for a direct return to LEO an *effective payload* mass of 571 kg must be lifted off the surface of Mars, but is this to the MAV insertion orbit (500x500 km, $i=45^\circ$)? Similarly for a direct earth entry the mass is 475 kg, which includes all the power, G&N and computing capabilities for the system. How were these stages sized? Are they part of the trade space in the study?

Answer 12

See the amended Table 1 in Exhibit 1, issued as a part of Addendum 3 on May 10, 2001. The Solar Electric Propulsion Stage (SEP) is considered a payload of specified mass to be lifted off from the Mars surface. The MAV Concept Study Contractors are not required to size SEP, but only to consider it as a payload of specified mass.

Question 13

The statement in Table 1 of Exhibit I that the 'MAV avionics provides system monitoring and data transmission during ascent' is unspecific. Can we assume that the *level* of systems monitoring and data transmission will be part of the trade study, for this surely affects the size, mass and power requirements of the avionics (sensors, transmitters, antennae, etc.)?

Answer 13

The MAV Concept Study will include the details of MAV avionics. As such, it is an essential part of this study.

Question 14

In Exhibit IV, back planetary protection is mentioned, but not forward planetary protection. Is this an oversight, or have the planetary protection requirements recently been eased for missions beyond earth?

Answer 14

Please see amended Exhibit IV issued as a part of Addendum 3 on May 10, 2001. Both forward and back planetary protections are still needed. However, for the MAV Concept Study, it is appropriate that you be aware of this important requirement, but not expend any significant labor hours to address the details of planetary protection requirements.

Question 15

What is the purpose of Exhibit II (does it repeat Table 1 in Exhibit I)?

Answer 15

This has been corrected in the amended Exhibit II issued as a part of Addendum 3 on May 10, 2001.

Question 16

Is Exhibit III repetitive of information contained in Exhibit I or in the RFP?

Answer 16

See the revised Exhibits issued as a part of Addendum 3 on May 10, 2001. Repetitions have been eliminated.

Question 17

In the Specimen Contract the launch date is stated to be 2011 (paragraph 1.3). Is this the launch date of the MSR mission from Earth (as stated in paragraph 1.0), or the date of MAV launch from Mars?

Answer 17

This date is the launch date of the MSR mission from Earth.

Question 18

Paragraph 1.10 of the Specimen Contract states that previous MAV study efforts will be made available at the Kickoff meeting. Paragraph 1.12 states that it is the contractor's responsibility to contact the JPL CTM for this information. Does paragraph 1.12 refer to current work (i.e. the MSR study) being done in parallel with the MAV study contract?

Answer 18

The MSR Technical Approach Phase 1 Study results will be made available to the MAV Concept Study Contractors by JPL at the MAV Kick-off meeting on 08/06/01, as well as any other related information regarding NASA in-house studies.

Question 19

During the oral presentation will a phone with speaker be made available through which additional team mates may participate by telecon? We assume that the proposer, not JPL, will be responsible for arranging the telecon service and the telecon costs.

Answer 19

A speakerphone will be available upon request for outside calls. However, the proposer, not JPL, will be responsible for arranging the telecon service and the telecon costs.

Question 20

We are hearing rumors that there will be changes to the MAV RFP. I checked the web site and didn't find any updates. Any truth to the rumor?

Answer 20

The revised RFP, Specimen Contract and Exhibits were posted on the Web on 05/10/01.

Question 21

The RFP specifies a baseline sample return architecture which uses a Solar Electric Propulsion Stage (SEPS) for direct return missions (Exhibit I, Table I). Are we to assume that the SEPS is carried to the Mars surface as part of the MAV, or that it remains in Mars orbit for rendezvous with the Orbiting Sample prior to return? Is it an integral part of the MAV or is it a separate element of the Mars Sample Return mission?

Answer 21

Please see the amended Table1 in Exhibit 1. The Solar Electric Propulsion Stage (SEPS) is considered a payload of specified mass to be lifted off from the Mars surface.

The MAV Concept Study Contractors are not required to size SEP, but only to consider it as a payload of specified mass.

SEPS design trades, and their operations are not included in the work scope. The SEP is considered a MAV payload of the specified mass that has to be lifted off the Mars surface.

Question 22

Are SEPS design trades included in the work scope? Does the scope include SEPS operations following MAV shutdown, including concepts for Earth aerocapture and landing?

Answer 22

SEPS design trades, and their operations are not included in the work scope. The SEP is considered a MAV payload of the specified mass that has to be lifted off the Mars surface.

Question 23

It has come to our attention that there are funding issues at JPL that include the Mars Project Office (i.e., Mars Sample Return Study has been asked to accept partial funding with the balance of the contractual funding being available no later than 01OCT01). My question is as follows: In light of the funding issues for FY2001, is there funding for the Mars Ascent Vehicle Trade Study. (Name deleted) is spending discretionary budget to support the proposal process and would like to know if the proposals will be accepted and a contract awarded.

Answer 23

The MAV Concept Study will be incrementally funded in accordance with the revised Specimen Contract as referenced above in paragraph 2 of this Addendum 4.